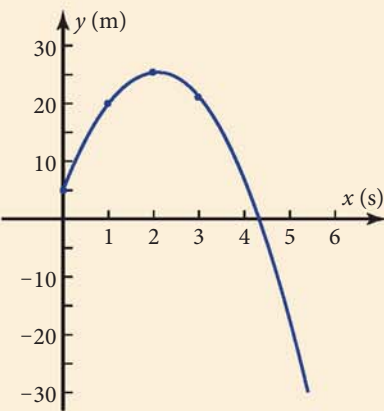


Mathematical Overview

In previous courses you have studied linear functions, quadratic functions, exponential functions, power functions, and others. In precalculus mathematics you will learn general properties that apply to all types of functions. In particular you will learn how to transform a function so that its graph fits real-world data. You will gain this knowledge in four ways.

GRAPHICALLY

The graph at right is the graph of a quadratic function. The y -variable could represent the height of an arrow at various times, x , after its release into the air. For larger time values, the quadratic function shows that y is negative. These values may or may not be reasonable in the real world.



ALGEBRAICALLY

The equation of the function is
$$y = -4.9x^2 + 20x + 5$$

NUMERICALLY

This table shows corresponding x - and y -values that satisfy the equation of the function.

x (s)	y (m)
0	5.0
1	20.1
2	25.4
3	20.9

VERBALLY

When the variables in a function stand for things in the real world, the function is being used as a mathematical model. The coefficients in the equation of the function $y = -4.9x^2 + 20x + 5$ have a real-world meaning. For example, the coefficient -4.9 is a constant that is a result of the gravitational acceleration, 20 is the initial velocity, and 5 reflects the initial height of the arrow.